Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Applications for Public Safety Pool (Conventional)	)	**File Nos. 0004270113**
Licenses in the 430-448 MHz Band for Mobile Use	)	***et al.***
of ReconRobotics Video and Audio Surveillance	)	
Systems	)	

To: The Chief, Public Safety and Homeland Security Bureau
Via: The Office of the Secretary

OPPOSITION TO MOTION FOR LEAVE TO FILE ADDITIONAL PLEADING AND TO RESPONSE OF RECONROBOTICS TO REPLY OF ARRL

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.45(b) of the Commission's rules [47 C.F.R. §1.45(b)], hereby respectfully submits its Opposition to the "*Motion for Leave to File Additional Pleading*" (the Motion) and to the accompanying *"Response of ReconRobotics, Inc. to Reply of ARRL"* (the Response), both of which were filed on or about March 26, 2012 by Reconrobotics, Inc. (ReconRobotics). For its Opposition, ARRL states as follows:

I. The Motion.

1. ReconRobotics Motion fails on its face to justify the filing of an unauthorized pleading. The Commission's rule governing Petitions for Reconsideration in adjudicatory proceedings, Section 1.106, permits precisely three pleadings: the Petition for Reconsideration, Oppositions thereto, and the Reply of the Petitioner to those Oppositions. There are page limitations for each type of pleading and strict filing deadlines. ReconRobotics is clearly not entitled to file a "surrebuttal" pleading. Furthermore, ReconRobotics did not wait for

Commission action on its motion. Instead, it filed its Response together with the Motion as a "captive" pleading, thereby forcing its unauthorized surrebuttal into the record. The Commission does not normally tolerate the filing of captive pleadings. ARRL objects to the tactical manipulation of the Commission's rules employed in this instance by ReconRobotics and urges the denial of the Motion.

2. Predictably, ReconRobotics' one-sentence justification for its Motion is that ARRL placed "new detail relating to ReconRobotics' bandwidth specification" in its Reply to Opposition to Petition for Reconsideration filed March 20, 2012. It would have been improper for ARRL to have raised new arguments in a reply pleading. But ARRL clearly did not do that, and ReconRobotics does not even attempt to document its claim to the contrary. The ARRL Petition for Reconsideration raised in effect one issue: the necessary bandwidth specification in the applications at bar. ReconRobotics addressed that one issue as best it could in its Opposition. ARRL responded directly and exclusively to the arguments raised by ReconRobotics in its Opposition, and made no other points.[1] ReconRobotics states that ARRL could have, but did not, provide this information in its initial Petition for Reconsideration. Actually, that would have required that ARRL anticipate the arguments in ReconRobotics' Opposition, which of course was impossible. ReconRobotics does not offer any specificity as to what it believes constitutes "new material" or "new detail" in ARRL's Reply that was not directly responsive to ReconRobotics' Opposition. Without such, it is impossible for ARRL to rebut the summary assertion. But for that same reason, ReconRobotics has failed utterly to justify the grant of its Motion and therefore its Response should be stricken from the record and not considered in adjudicating ARRL's Petition for Reconsideration.

[1] As is obvious from even a cursory reading of ARRL's *Reply to Opposition to Petition for Reconsideration*, ARRL's argument principally used ReconRobotics' own data concerning the bandwidth of the Recon Scout, with most of the discussion focusing on interpreting their data correctly.

II. The Response.

3. In the event that the Commission does substantively consider ReconRobotics' Response, it should be aware that ReconRobotics' sophistry continues unabated relative to the argument contained therein. *ReconRobotics is wrong in claiming that the necessary bandwidth of its device is 100 kHz*; it is wrong in its argument that necessary bandwidth is somehow a subset of the occupied bandwidth; and in any case, that argument is unavailing because ReconRobotics' measurement of the occupied bandwidth of its device is fatally flawed.

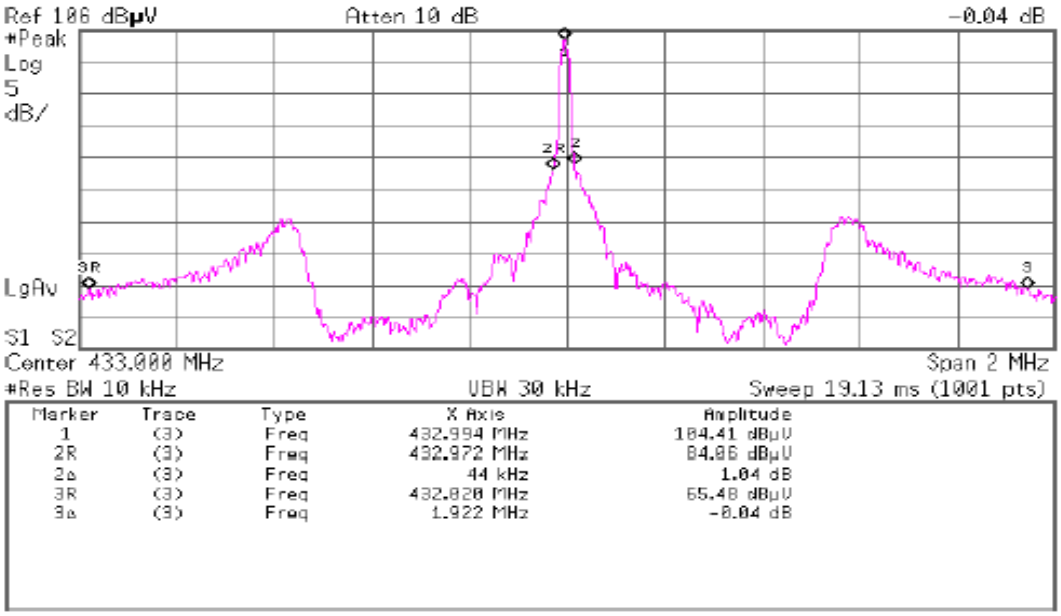
4. ReconRobotics continues to insist that the necessary bandwidth of a full-resolution, double-sideband monochrome analog AM video signal is in the range of 100 kHz. To justify this untenable position it has alternated between: (1) claiming that there is no distinction between occupied bandwidth and necessary bandwidth, and (2) tortured interpretations of definitions in the Commission's rules that cannot be supported from a technical, regulatory or common sense perspective. The premise appearing in the Response, that necessary bandwidth is somehow a subset of occupied bandwidth, rather than the occupied bandwidth which is necessary to convey the information being communicated, is particularly difficult to reconcile with the definitions of occupied bandwidth, necessary bandwidth, and authorized bandwidth in the Commission's rules and in the international Radio Regulations. It is also impossible to square with the requirements in the Part 90 rules for spectral masks and permitted emission levels.

5. The test data provided by ReconRobotics in its application for certification do not support the argument relative to necessary bandwidth taken by ReconRobotics in its Response. Its test data are not consistent with the measurements of occupied bandwidth; with measurements performed to show the bandwidth of the signals from its equipment under different modulation conditions; or with the testing that it did to demonstrate compliance with the requirements for

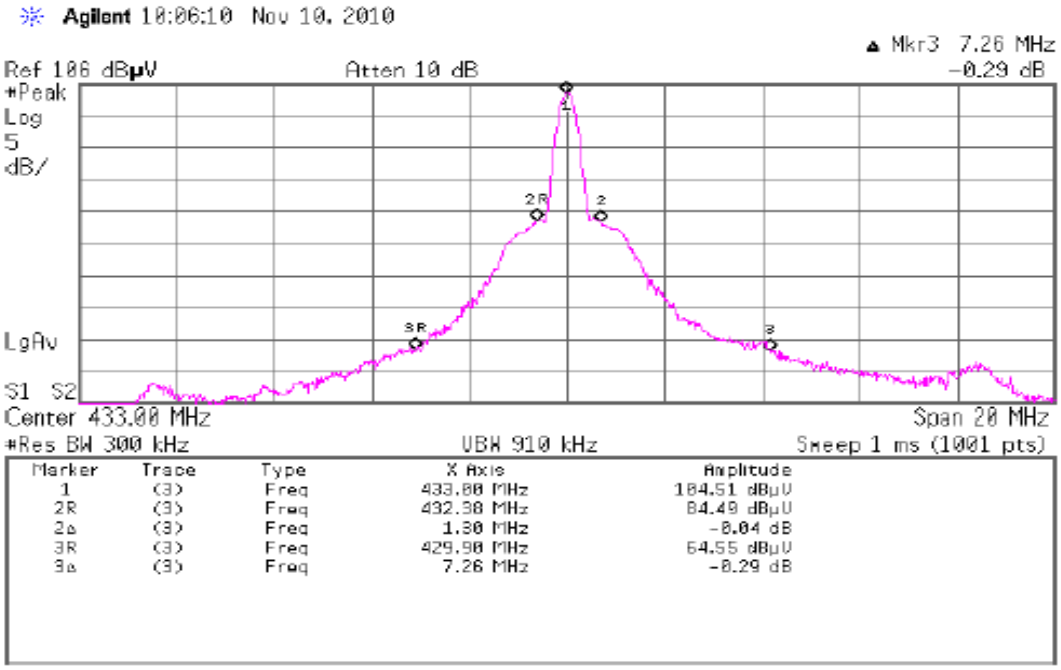
spectral masks in Section 90.210 of the Commission's Rules. Section 90.210 specifies requirements for suppression of emissions outside the authorized bandwidth[2] of a particular device or transmission. If the authorized bandwidth is assumed to be 100 kHz, then the test results provided by ReconRobotics showing measured bandwidth demonstrate non-compliance with this rule. The figures on the following page, ReconRobotics' *own data*, show that outside of the +/- 250% of the authorized bandwidth frequency range, +/- 250 kHz in this case, the emissions under various modulation conditions *significantly* exceed the -43 dBc (or -13 dBm for a 1-watt transmitter) levels.

6. If the assumption that ReconRobotics has made -- that the 100 kHz necessary bandwidth is the same as the occupied bandwidth, which is the same as the authorized bandwidth -- is presumed to be correct, then ReconRobotics' *own test results* show that for a number of modulation conditions, the device is not in compliance with Sec. 90.210 based on its 100-kHz bandwidth specification.

[2] Section 90.7 of the Commission's rules defines *Authorized bandwidth* as "The frequency band, specified in kilohertz and centered on the carrier frequency containing those frequencies upon which a total of 99 percent of the radiated power appears, extended to include any discrete frequency upon which the power is at least 0.25 percent of the total radiated power.



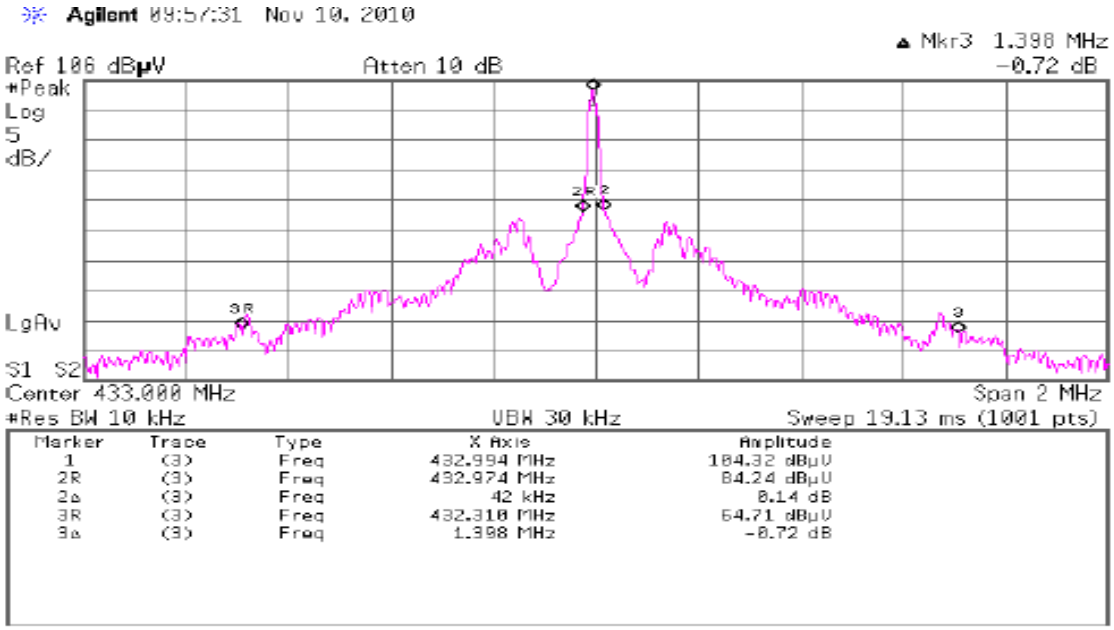
(a) 10 kHz RBW



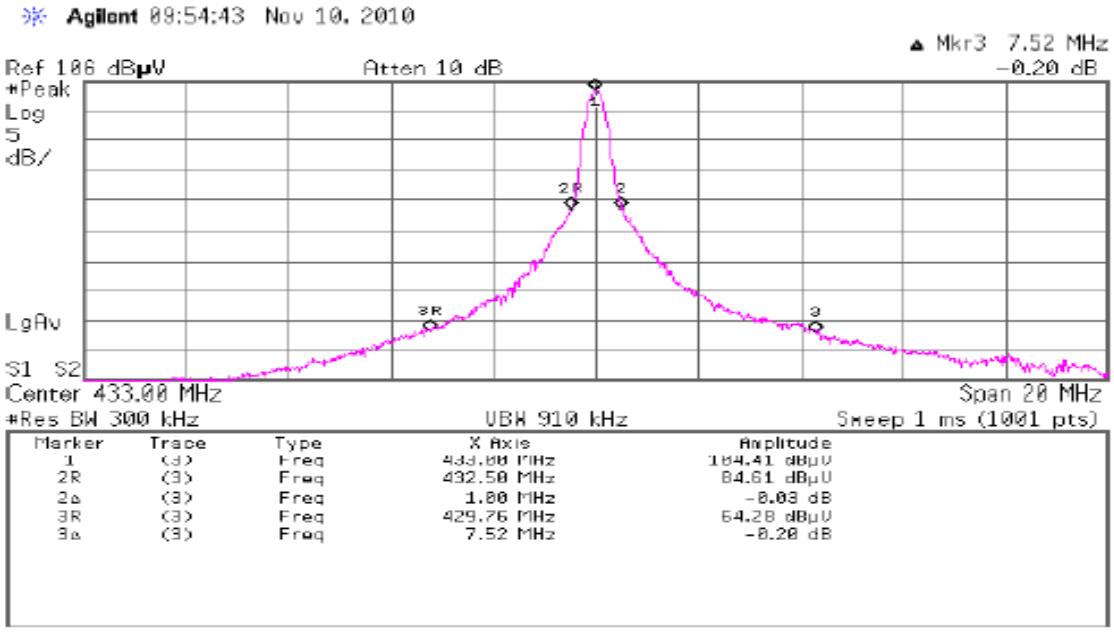
(b) 300 kHz RBW

Figure 12: Plots of 433 MHz transmission viewing 1/8" checkered background.

Figure 1 -- This figure shows the resultant spectral output of the ReconRobotics Scout when viewing a 1/8" checkered background. In this case, the emissions at frequencies greater than +-250% of the authorized bandwidth are worse than the -43 dBc (-13 dBm for a 1-watt transmitter) required by Section 90.210. The device only passes this -43 dBc requirement if a 6 MHz bandwidth is assumed.



(a) 10 kHz RBW



(b) 300 kHz RBW

Figure 14: Plots of 433 MHz transmission viewing 1/2" checkered background.

Figure 2 -- These data show the spectral output of the ReconRobotics Scout when viewing a ½" checkered pattern. This shows even worse compliance with respect to the provisions of Section 90.210.

It is clear from the example figures provided above that if the necessary bandwidth of the

ReconRobotics Scout is 100 kHz, this would result in the untenable premise that the very

modulation that results from the "transmission of information at the rate and with the quality required" does not comply with a spectral mask for spurious emissions based on an authorized bandwidth of 100 kHz. Spurious emissions are defined at Section 2.1 of the Commission's rules[3] as follows:

> *Spurious Emission.* Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions. (RR)

It is clear that these video components, even if below the level represented by 99% bandwidth and occupied emissions, cannot be spurious emissions because they are created by the very video components being transmitted. ReconRobotics cannot have it both ways: either its device does not have a necessary bandwidth of 100 kHz, or else its device cannot have met the spectral mask requirements of Section 90.210 relative to spurious emissions.

7. ReconRobotics' Response dwells on language in Section 2.202 relative to the definition of "necessary bandwidth" for its premise that necessary bandwidth is necessarily a subset of the occupied bandwidth. ARRL earlier cited the necessary bandwidth definition in Section 2.202 of the Commission's rules as well. However, the Section 2.202 definition is inconsistent with the definition of necessary bandwidth in the international Radio Regulations, which is also the definition set forth in Section 2.1 of the Commission's Rules. Section 2.1 of the Commission's rules is clear that the definition of necessary bandwidth set forth in that Section is definitive:

> (a) Where a term or definition appears in this part of the Commission's Rules, it shall be the definitive term or definition and shall prevail throughout the Commission's Rules.
>
> (b) The source of each definition is indicated as follows:

[3] This definition is taken from the international Radio Regulations, as indicated in the definition.

CS—Annex to the Constitution of the International Telecommunication Union (ITU)
CV—Annex to the Convention of the ITU
FCC—Federal Communications Commission
RR—ITU Radio Regulations

(c) The following terms and definitions are issued:

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Necessary Bandwidth. For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions. (RR)

*****

8. This definition is different from that found in Section 2.202 in that the prevailing definition immediately above does not relate the necessary bandwidth to the separate concept of occupied bandwidth at all. In the Section 2.1 definition above it is quite clear that necessary bandwidth is related only to the transmission of information at the rate and with the quality required. This is an important distinction, as it is the only definition and interpretation that makes sense from a technical and regulatory perspective when considered along with other definitions and the test data of spectral masks (Sec. 90.210) provided by ReconRobotics.

9. The untenable premise of a 100 kHz necessary bandwidth for the Recon Scout is *not* included in the testing for compliance with Sec. 90.210 that ReconRobotics provided in the test report that was submitted to the Commission in its application for certification. In that report, *ReconRobotics used the very bandwidth that ARRL has shown is correct for a monochrome, double-sideband AM video signal with no aural carrier -- a 6 MHz necessary bandwidth and a resultant 250% bandwidth of 15 MHz:*

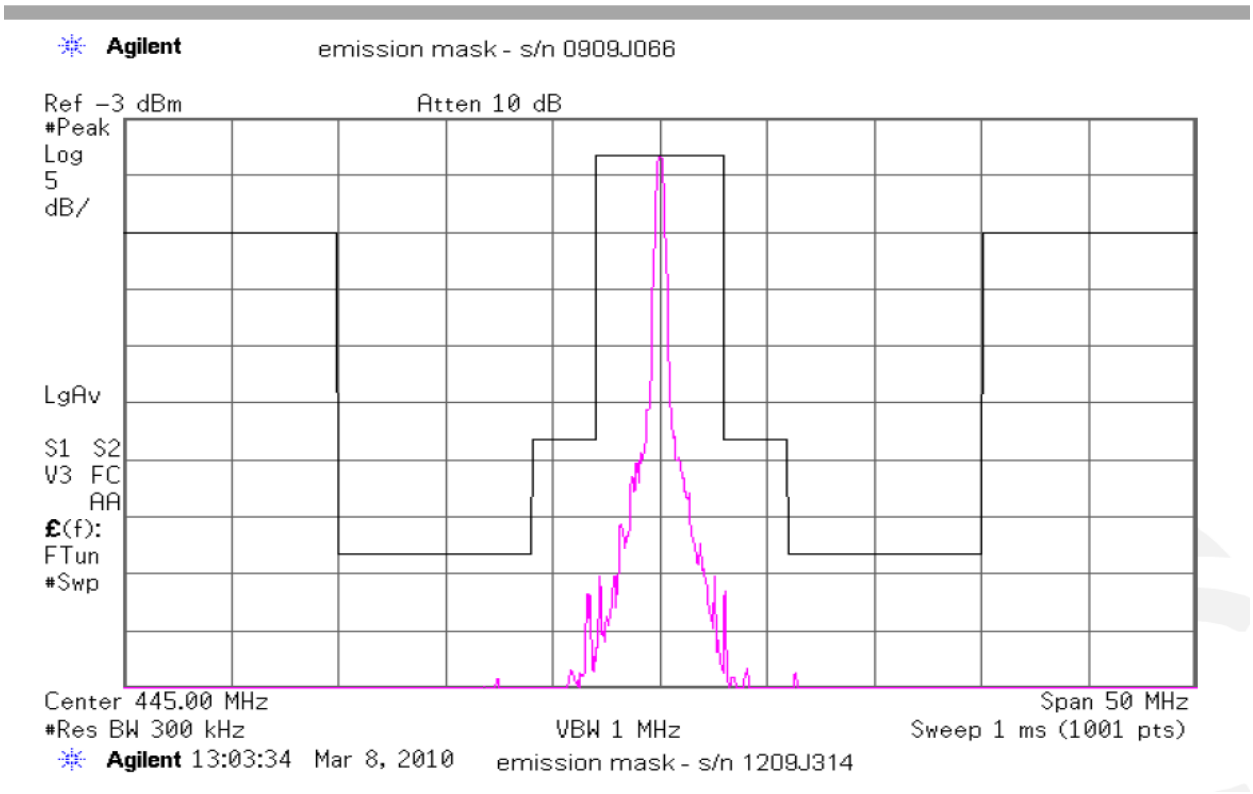

Figure 3 -- This shows the measurement data provided by ReconRobotics to demonstrate compliance with the Section 90.210 requirements for spectral masks of out-of-band emissions. It is clear from the data that this transmitter would not pass the spectral mask requirements at +/- 250% of a 100 kHz bandwidth. From the limit lines drawn by ReconRobotics on this graph, the bandwidth that it assumed for this compliance test is the correct 6 MHz that represents the necessary bandwidth of a monochrome, high-speed video signal.

Figure 3 above shows one of the measurements provided by ReconRobotics to demonstrate compliance with the Part 90 requirements for a spectral mask. There are a few errors in this part of the test report, although ReconRobotics is correct in its choice of 6 MHz as the necessary and appropriate bandwidth for the test. The first error is that the limits at +/- 250% and greater are not the -13 dBc as shown on the graph. Although for a 1-watt signal, the limits would indeed be -13 dBm, this is relative to the full-output power of the transmitter at +30 dBm, not a level relative to the attenuated carrier shown on this graph. More importantly, the test-report indicates that "emission mask B" was chosen for this test. ARRL is unaware of any rationale for choosing

a mask specific to transmitters with filtered audio to represent a transmitter that does not transmit any audio. It is even more difficult to explain how ReconRobotics could take the position that the necessary bandwidth of the ReconRobotics Scout is 100 kHz rather than 6 MHz when ReconRobotics' own certification data indicate that it used a 6 MHz bandwidth to demonstrate compliance with the Part 90 rules. Again, ReconRobotics cannot have it both ways, though it is certainly trying hard enough.

10. ReconRobotics assumption that a measurement of the 99% occupied bandwidth is equivalent to the necessary bandwidth is flatly wrong. Necessary bandwidth is based on the bandwidth *needed to convey the desired information*. ReconRobotics own measured data show that frequencies removed from the carrier of up to 3 MHz are very much a part of the video information being seen on the television picture. Its own test data show that if a 100 kHz bandwidth is used for spectral-mask testing, the video information being transmitted would fall outside the 250% bandwidth window; and that the video outside that window is at a transmitted level that would fail the requirements of Section 90.210. Its own test data used a bandwidth of 6 MHz to demonstrate compliance with Section 90.210. Putting all of these facts together, it can only reasonably be concluded that ReconRobotics' TCB certification grants were wrong, and therefore each and all of its customers' license applications are in error and should not have been granted. The error is in using a measurement of occupied bandwidth for the selection of an emission designator not supported by ReconRobotics' own testing. The correct *necessary* bandwidth is 6 MHz. This is supported by the language of the rules and the measured data for bandwidth. A 6 MHz bandwidth would no longer constitute a violation of Section 90.210 because it accounts for components of the video modulation. A 6 MHz bandwidth is consistent with the test methods and findings in ReconRobotics' spectral-mask testing.

Therefore, for all of the above reasons, ARRL, the National Association for Amateur Radio, respectfully requests that the Commission (a) deny the Motion for Leave to File Additional Pleading; (b) strike from the record the Response of ReconRobotics, Inc. to Reply of ARRL; and (3) vacate the licenses granted for use of the Recon Scout device.

Respectfully submitted,

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April 3, 2012

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify that I caused to be mailed, via first class U.S. Mail, postage prepaid, a copy of the foregoing to the following, this 3rd day of April, 2012. As to the applicants affected by this Petition, they were served via ULS online filing this 3rd day of April, 2012.

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